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**TROGLOBOCHICA, A NEW GENUS FROM CAVES IN JAMAICA,
AND REDESCRIPTION OF THE GENUS BOCHICA CHAMBERLIN
(PSEUDOSCORPIONIDA, BOCHICIDAE)**

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ABSTRACT

The genus *Bochica* Chamberlin is redefined based on a redescription of the type species, *Bochica withi* (Chamberlin). The new genus *Troglobochica* is defined, including two new species from caves in Jamaica.

INTRODUCTION

Two pseudoscorpions collected in caves in Jamaica by Stewart B. Peck prove to be representatives of an undescribed genus closely allied to *Bochica* Chamberlin, known from Grenada and Trinidad. In order to compare the new genus with *Bochica* it is first necessary to redefine the latter, including a redescription of the type species *Bochica withi* (Chamberlin).

Bochica Chamberlin

Bochica Chamberlin 1930:43, 1931:220; Beier 1932:168; Roewer 1937:255; Muchmore 1982:98.
Type species *Ideoroncus withi* Chamberlin 1923.

Diagnosis (revised).—A neobisioid genus with the characters of the type species as described below. Chief among these are the following. Palpal chela with venom apparatus well developed in both fingers, venom ducts extending about 2/5 lengths of fingers from tips; movable finger with 4 trichobothria, evenly spaced along finger; fixed finger and hand with 8 trichobothria—*et* and *it* close to tip, *est* and *ist* a little distad of middle, *isb*, *esb* and *eb* in an oblique row at base of finger, and *ib* on dorsum of hand proximad of middle; marginal teeth of both fingers well developed, contiguous. Cheliceral hand with 5 setae; flagellum of 3 small, denticulate setae; both fingers dentate; galea a long tapering stylet. Carapace without an epistome; generally smooth but with a reticulated transverse band near posterior margin; 2 eyes; about 16 large, acuminate setae dorsally and 1 (or more?) small setae on each side. Apex of palpal coxa acute and with 2 long, subequal

setae. Abdominal tergites entire; sternites 3-7 indistinctly divided; pleural membranes longitudinally, smoothly striate; middle tergites with 6-7 setae; middle sternites with 8-10 setae, central 2 of sternites 8-10 enlarged and displaced anteriorly. Legs moderately slender; interfemoral articulation of leg IV oblique; metatarsus of leg IV with a long tactile seta; subterminal tarsal setae denticulate; arolia entire, with scalloped edge, shorter than claws which are long and slender. Internal genitalia not known accurately.

Remarks.—*Bochica* is the type genus of the subfamily Bochicinae Chamberlin (1930), which has been elevated to family rank by Muchmore (1982). A full discussion of the relations of this genus to others in the family will be presented elsewhere (Muchmore, in preparation).

Bochica withi (Chamberlin)

Figs. 1, 2

Ideoroncus mexicanus Banks (misidentification), With 1905:127.

Ideoroncus withi Chamberlin, 1923:359 (new name for form described as *I. mexicanus* by With).

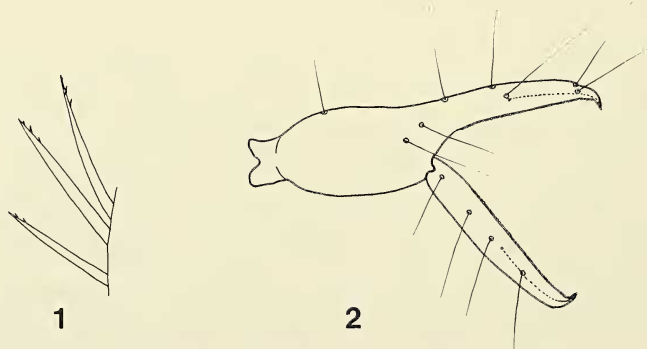
Bochica withi (Chamberlin), Chamberlin 1930:44, 1931: Figs. 13L, 15H, 28J, 28K, 36F, 42B; Beier 1932:168.

Material examined.—The holotype female (JC486.01001) from Chantilly, GRENADA, West Indies, in the British Museum (Natural History), was examined entire in alcohol and glycerine. Another specimen (JC2210.01001), in the J. C. Chamberlin Collection, was studied in detail; this is a male from Las Hermanas, TRINIDAD, collected by E. McCallen about 1943, cleared, dissected and mounted on a slide by Chamberlin.

Description.—An excellent general description of the type specimen was given by With (1905); this has been supplemented by Chamberlin (1930, 1931). Their observations can be recast as follows, together with some additions and corrections based mainly on the mounted specimen from Trinidad.

Carapace longer than broad; anterior margin straight, no epistome; surface mostly smooth, but with distinct transverse reticulated band near posterior margin; 2 corneate eyes; 16 seta bases (setae lost) on dorsum (4 at both anterior and posterior margins) and 1 small seta evident on one side anterior and ventral to eye. Coxal region as shown by With (Pl. X, fig. 1a); apex of palpal coxa acute, bearing 2 long, subequal setae.

Abdominal tergites entire, but sternites 3-7 with faint lines of division; pleural membranes smoothly, longitudinally striate. Tergal chaetotaxy of mounted male about 5:4:6:



Figs. 1, 2.—*Bochica withi* (Chamberlin), specimen from Trinidad: 1, cheliceral flagellum; 2, right chela, lateral view.

6:6:6:6:7:7:7:2; sternal chaetotaxy ?:[1-1]:(2)7(2):(2)7(2):10:9:10:9:8:8:4:2; central 2 setae of sternites 8-10 enlarged and displaced anteriorly. Internal genitalia of male specimen everted and distorted, but apparently generally neobisioid in form.

Chelicera as shown by With (1905, Pl. IX, figs. 2b, c, d,) and Chamberlin (1931, Fig. 13L); more than half as long as carapace; hand with 5 long, acuminate setae; flagellum of 3 (2 in one case) widely spaced, small, subequal setae, each with subterminal spinules (Fig. 1); both fingers dentate, movable finger with a large laterally displaced, subterminal tooth, which is continuous with a row of 7 small teeth; galea a long tapering stylet; serrula exterior with about 24 blades.

Palp as shown by With (1905, Pl. X, figs. 1b, c) and Chamberlin (1931, Fig. 28J); femur about as long as carapace, tibia a little shorter, chela 1.65 times as long as carapace. Palpal trochanter 2.05, femur 3.55, tibia 3.1, and chela 3.5 times as long as broad; hand 1.7 times as long as deep; movable finger 1.3 times as long as hand. All surfaces apparently smooth. Trichobothria of chela as shown by Chamberlin (1931, Fig. 36F) and in Fig. 2; notable are *est* and *ist* both distad of middle of fixed finger, *isb*, *esb* and *eb* in a oblique row on external surface of hand, and *ib* on dorsum of hand proximad of middle. (It should be noted here that in Chamberlin's Fig. 36F the labels for *est* and *ist* are transposed.) Fixed finger with about 65 and movable finger with about 60 contiguous, low, cusped marginal teeth; venedens and venom apparatus well-developed in each finger; venom ducts long, with nodus ramosus about 2/5 length of finger from tip.

Legs moderately slender (see With 1905, Pl. X, figs. 1d, e)? leg IV with entire femur 2.85 and tibia 3.85 times as long as deep. Interfemoral articulation of leg IV oblique to long axis. Subterminal tarsal setae dentate on distal halves (With 1905, Pl. X, fig. 1f); arolia entire, with frilled edge, and shorter than claws, which are long and slender (Chamberlin 1932, Fig. 42B). Metatarsus of leg IV with a long tactile seta proximad of middle.

Measurements (mm) of mounted male from Trinidad.—Body length 3.0. Carapace length 0.73. Chelicera 0.385 by 0.17. Palpal trochanter 0.41 by 0.20; femur 0.725 by 0.205; tibia 0.705 by 0.23; chela (without pedicel) 1.20 by 0.35; hand (without pedicel) 0.56 by 0.33; pedicel 0.19 long; movable finger 0.73 long. Leg IV: entire femur 0.65 by 0.235; tibia 0.48 by 0.125; metatarsus 0.205 by 0.085; telotarsus 0.365 by 0.07.

Remarks.—In all preceding publications on this species, the type locality has been given simply as Chantilly, Windward Islands. However, one of the labels in the vial with the holotype mentions Grenada. Also the West Indies and Caribbean Year Book for 1971. (p. 455) lists Chantilly as an estate on Grenada, though its location on the island is not indicated; no estate of this name is listed for any of the other Windward Islands. Therefore, it seems certain that the type locality is on the island of Grenada.

There is no doubt that the specimen from Trinidad is conspecific with that from Grenada. All characters are similar and the sizes are comparable.

Troglobochica, new genus

Type species.—*Troglobochica jamaicensis* Muchmore, new species.

Etymology.—From the Greek *trogle*, hole, and the generic name *Bochica*, indicating a cave-dwelling relative of *Bochica*.

Diagnosis.—A neobisioid genus bearing much resemblance to *Bochica* Chamberlin but with a different cheliceral flagellum and distinctly modified for life in caves. Large, with carapace and palpal femur both greater than 1 mm in length. Carapace distinctly

longer than broad; surface smooth or finely reticulated, with a broad transverse band posteriorly; no eyes; with about 30 large, acuminate setae dorsally and 2-4 small setae on each side. Apex of palpal coxa acute, with 2 long, subequal setae. Abdominal tergites and sternites entire, except anterior sternites may be indistinctly divided; middle tergites with 7-10 setae; middle sternites with 12-16 setae, of which 1-2 central ones may be enlarged and displaced anteriorly of marginal row; pleural membranes longitudinally smoothly striate. Both fingers of chelicera dentate; galea a long slender stylet; hand with 6 setae; flagellum of 2 close-set long, stout, terminally denticulate setae with a small spinule in front of and behind the pair. Palpal chela with venom apparatus well developed in each finger, nodus ramosus about 1/3 length of finger from tip; movable finger with 4 trichobothria, fairly evenly spaced along finger; fixed finger and hand with 8 trichobothria—*et* and *it* close to tip, *est* and *ist* near middle of finger, *isb*, *esb* and *eb* in oblique row on base of finger, and *ib* on dorsum of hand in basal half; each finger with complete row of distinct, contiguous, marginal teeth; fixed finger with a small tooth or tubercle on internal side at level of 6th or 7th marginal tooth; femur of one form (*pecki*, female) with a slightly elevated glandular area on outer side near base, the other form (*jamaicensis*, male) showing no sign of such a feature. Leg segments slender; subterminal tarsal setae denticulate on distal halves; metatarsus of leg IV with a long, tactile seta proximad of middle; arolia entire, with frilled edge, and shorter than claws, which are long and slender. Genitalia of male as figured and much like those of *Bochica* (personal observation); genitalia of female as figured (those of *Bochica* not known).

Remarks.—This genus is clearly similar to *Bochica* in many respects. However, it differs notably in the form of the cheliceral flagellum, which here consists of 2 close-set, rather stout, setae and a spinule both in front of and behind the pair while in *Bochica* it consists of 3 widely-spaced, small tapering setae. *Troglobochica* is further distinguished from *Bochica* in being eyeless, larger, and with more slender appendages, all adaptations to the cave environment.

The flagellum of *Troglobochica* is more like that of *Antillobisium* Dumitresco and Orghidan (1977), where there are 3 close-set stout setae and a small spine in front. *Troglobochica* differs from *Antillobisium* in having the pedal arolia shorter than the claws, which are long and slender; the surfaces of the palps are mostly smooth in the former but heavily granulate in the latter; and trichobothrium *est* is distal to *ist* in *Troglobochica* (as in *Bochica*) whereas the 2 are at the same level or *ist* is slightly distal to *est* in *Antillobisium*.

Troglobochica jamaicensis, new species

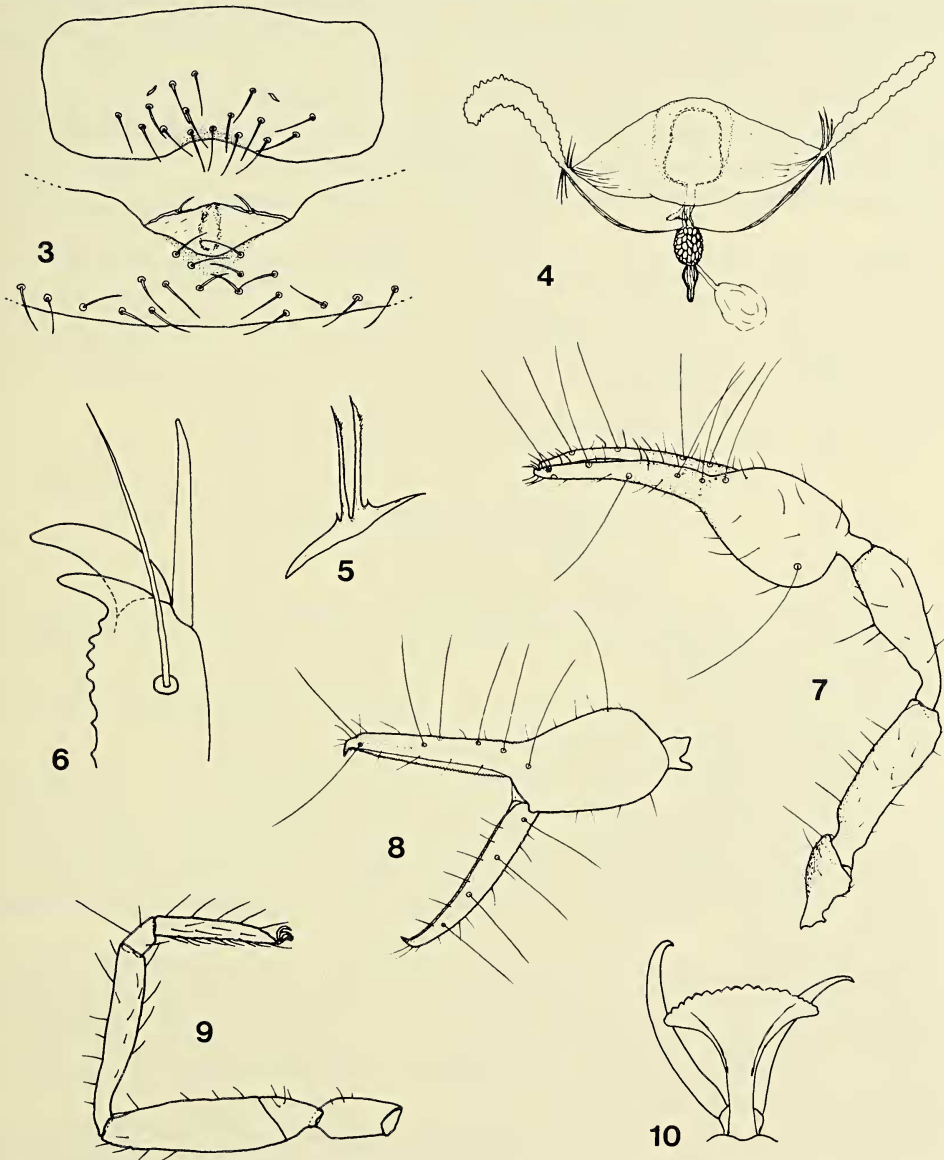
Figs. 3-10

Material.—Holotype male (WM3920.01001) from Jackson Bay Great Cave, Jackson Bay, Clarendon Parish, JAMAICA, 2 August 1974, S. B. Peck; in Florida State Collection of Arthropods, Gainesville, FL.

Description of male (female unknown).—Carapace and palps brown, other parts lighter brown; tergites 1-5 uniformly colored, 6-10 with irregular light spots on each side. Carapace longer than broad; anterior margin without epistome; no eyes; surface mostly smooth but reticulate laterally and in a broad, transverse band posteriorly; with about 28 large setae dorsally (6 at both anterior and posterior margins) and 3-4 small setae on each side. Coxal area without unusual features; apex of palpal coxa acute, bearing 2 long, subequal setae.

Abdominal tergites and sternites entire, except sternites 4 and 5 partially divided; surfaces reticulated anteriorly, becoming smooth posteriorly; pleural membranes longitudinally smoothly striate. Tergal chaetotaxy of holotype male 5:5:5:7:9:8:9:9:9:10:TITI:2. Sternal chaetotaxy 17:[1-1]:(1)12/8(1):(1)10(1):11:12:14:12:9:10:TITITIT:2; on sternites 6-8, two setae at center displaced anteriorly of marginal row. Genital opercula as in Fig. 3, internal genitalia as in Fig. 4.

Chelicera 0.5 as long as carapace; hand with 6 long, acuminate setae; flagellum of 2 close-set, long, terminally denticulate setae, with a small spinule in front of and behind the setae (Fig. 5); fixed finger with 13 medium sized teeth, distal one largest; movable



Figs. 3-10.—*Troglbochica jamaicensis*, new species, holotype male: 3, genital opercula; 4, internal genitalia; 5, cheliceral flagellum; 6, tip of movable finger of chelicera, lateral view; 7, right palp, dorsal view; 8, left chela, lateral view; 9, leg IV; 10, tip of pedal tarsus showing claws and arolium.

finger with a large, laterally displaced subterminal tooth, which is continuous with a row of 9 small teeth (Fig. 6); galea a long, slender stylet; serrula exterior with 33 blades.

Palp rather long and slender (Fig. 7); femur 1.09, tibia 1.05 and chela 1.99 times as long as carapace. Palpal trochanter 2.15, femur 3.7, tibia 3.0, and chela 3.2 times as long as wide; hand 1.5 times as long as deep; movable finger 1.3 times as long as hand. Surfaces smooth except for small scattered granules on inner sides of trochanter and femur, distal end of tibia, medial side of chelal hand at base of fingers, and basal half of each finger. Trichobothria of chela as shown in Fig. 8. Fixed chelal finger with 79 and movable finger with 70 contiguous, low, retrodentate teeth; fixed finger also with a single internal accessory tooth or tubercle at level of 6th marginal tooth, apparently functioning as a stop for tip of movable finger. Venom apparatus well developed in each finger, nodus ramosus about 1/3 length of finger from tip.

Legs slender; leg IV (Fig. 9) with entire femur 4.15 and tibia 6.25 times as long as deep. Interfemoral articulation of leg IV oblique to long axis. Subterminal tarsal setae denticulate on distal halves; arolia entire, with frilled edge, and shorter than claws, which are long and slender (Fig. 10). Metatarsus of leg IV with a long tactile seta proximad of middle.

Measurements (mm).—Body length 4.08. Carapace length 1.16. Chelicera 0.585 by 0.195. Palpal trochanter 0.70 by 0.325; femur 1.26 by 0.34; tibia 1.22 by 0.41; chela (without pedicel) 2.31 by 0.72; hand (without pedicel) 1.00 by 0.67; pedicel 0.19 long, movable finger 1.30 long. Leg IV: entire femur 1.125 by 0.27; tibia 0.97 by 0.155; metatarsus 0.21 by 0.11; telotarsus 0.63 by 0.105.

Etymology.—The species is named for Jamaica where it is found.

Troglobochica pecki, new species

Figs. 11-15

Material.—Holotype female (WM3918.01001) from Drip Cave, Stewart Town, Tre-lawny Parish, JAMAICA, 25 August 1974, S. B. Peck; in Florida State Collection of Arthropods, Gainesville, FL.

Diagnosis.—Similar to *T. jamaicensis* but larger (palpal femur length > 1.5 mm) and with more slender appendages (palpal femur $l/w > 5.5$).

Description of female (male unknown).—Carapace and palps brown, other parts lighter brown; most tergites and sternites with irregular light spots on each side. Carapace longer than broad; anterior margin without epistome; no eyes; surface reticulated, especially in a broad, transverse band posteriorly; with about 32 large setae dorsally and 2 smaller ones on each side. Coxal area not unusual; apex of palpal coxa acute bearing 2 long, subequal setae.

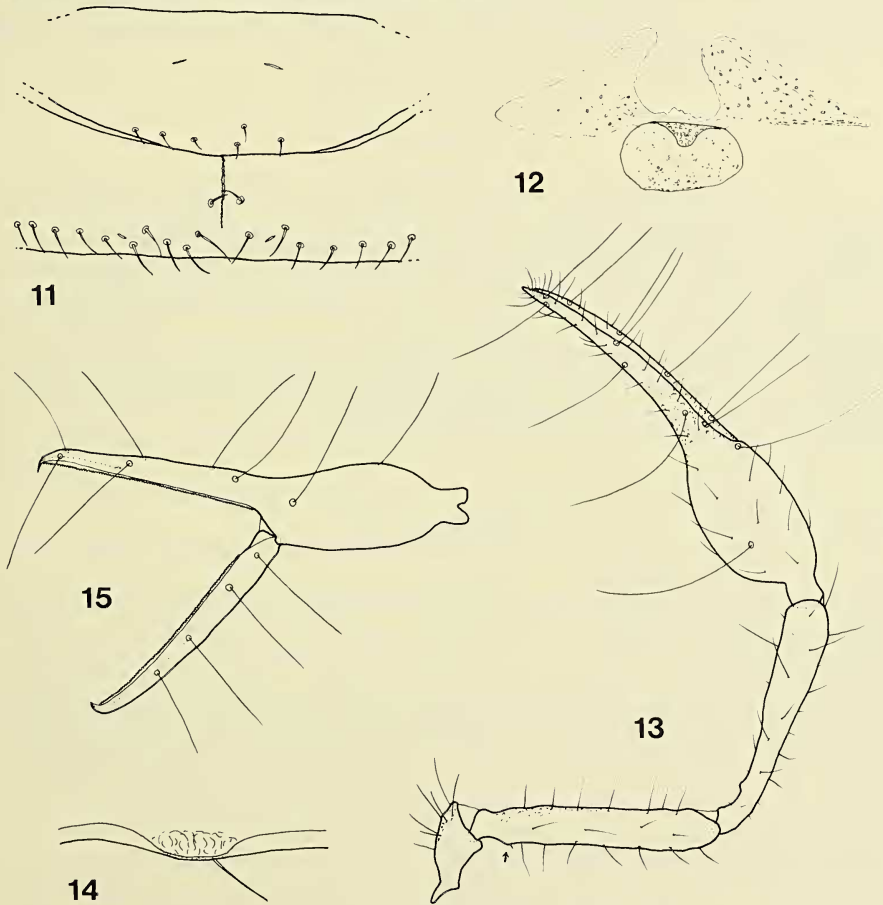
Abdominal tergites and sternites entire, surfaces finely reticulate; pleural membranes longitudinally smoothly striate. Tergal chaetotaxy 4:5:6:9:8:8:9:9:10:7:TIT:2. Sternal chaetotaxy 6:(1)19(1):(1)13(1):15:17:15:13:12:13:TIT2T2T:2; genital opercula as in Fig. 11; on sternites 4-9, one or 2 setae at center displaced anteriorly of marginal row. Internal genitalia as shown in Fig. 12.

Chelicera 0.52 as long as carapace; hand with 6 setae, flagellum of 2 close-set, long, terminally denticulate setae, with a small spinule in front of and behind the pair, as in *T. jamaicensis*; fixed finger with 15 medium sized teeth, the distal one largest; movable finger with a large laterally displaced subterminal tooth, followed proximally by a row of about 9 small, rounded teeth; galea a long slender stylet; serrula exterior with 36 blades.

Palp long and slender (Fig. 13); femur 1.36, tibia 1.36 and chela 2.24 times as long as carapace. Palpal trochanter 2.2, femur 5.95, tibia 5.5 and chela 4.5 times as long as wide, hand 1.9 times as long as deep; movable finger 1.44 times as long as hand. Surfaces mostly smooth, but fine granulation on trochanter and bases of chelal fingers. Femur with a slightly elevated glandular area on outer side near base (Figs. 13 and 14). Trichobothria of chela as in Fig. 15. Fixed finger with 97 and movable finger with 90 contiguous marginal teeth; fixed finger with a single internal accessory tooth or tubercle at level of 7th marginal tooth. Venom apparatus well developed in each finger, nodus ramosus about 1/3 length of finger from tip.

Legs slender: leg IV with entire femur 5.65 and tibia 8.35 times as long as deep. Subterminal tarsal setae dentate on distal halves; arolia shorter than claws. Metatarsus of leg IV with a long tactile seta proximad of middle.

Measurements (mm).—Body length 4.85; carapace length 1.29; Chelicera 0.665 by 0.31. Palpal trochanter 0.74 by 0.34; femur 1.75 by 0.295; tibia 1.76 by 0.32; chela (without pedicel) 2.89 by 0.64; hand (without pedicel) 1.185 by 0.615; pedicel 0.19 long; movable finger 1.71 long. Leg IV: entire femur 1.465 by 0.26; tibia 1.25 by 0.15; metatarsus 0.32 by 0.125; telotarsus 0.95 by 0.105.



Figs. 11-15.—*Troglbochica pecki*, new species, holotype female: 11, genital opercula; 12, internal genitalia; 13, right palp, dorsal view; arrow points to glandular area on femur; 14, enlargement of glandular area on femur, optical section; 15, left chela, lateral view.

Etymology.—The species is named in honor of Stewart B. Peck, who collected this and many other cavernicolous animals in Jamaica.

Remarks.—The glandular area near the base of the palpal femur is similar in position and general appearance to the glandular tubercles found in species of *Vachonium* Chamberlin (1947) and in *Antillobisium vachoni* Dumitresco and Orghidan (1977). However, in *Troglobochica pecki* the organ is not much elevated and a distinct duct to the surface is not apparent. It is of interest to note that no such structure occurs in *Troglobochica jamaicensis* (male), nor does it occur in *Antillobisium mitchelli* Dumitresco and Orghidan (male).

Jackson Bay Great Cave and Drip Cave, the type localities of *T. jamaicensis* and *T. pecki*, are about 70 km apart, the former near the southern coast and the latter near the northern coast of Jamaica (Peck 1975).

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LITERATURE CITED

- Beier, M. 1932. Pseudoscorpionidea I. Subord. Chthoniinea et Neobisinea. *Tierreich*, 57:1-258.
- Chamberlin, J. C. 1923. New and little known pseudoscorpions, principally from the islands and adjacent shores of the Gulf of California. *Proc. California Acad. Sci.*, 12:353-387.
- Chamberlin, J. C. 1930. A synoptic classification of the false scorpions or chela-spinners, with a report on a cosmopolitan collection of the same. Part II.—The Diplosphyronida (Arachnida-Chelonethida). *Ann. Mag. Nat. Hist. (ser. 10)*, 5:1-48, 585-620.
- Chamberlin, J. C. 1931. The arachnid order Chelonethida. *Stanford Univ. Publ. Biol. Sci.*, 7:1-284.
- Chamberlin, J. C. 1947. The Vachoniidae, a new family of false scorpions represented by two new species from caves in Yucatan. *Bull. Univ. Utah*, 38(7):1-15.
- Dumitresco, M. and T. N. Orghidan. 1977. Pseudoscorpions de Cuba. *Res. Exp. biospeol. cubano-roum. Cuba*, 2:99-122.
- Muchmore, W. B. 1982. Pseudoscorpionida. *In* *Synopsis and Classification of Living Organisms*. McGraw-Hill Book Co., New York, vol. 2:96-102.
- Peck, S. B. 1975. The invertebrate fauna of tropical American caves, Part III: Jamaica, an introduction. *Int. J. Speleol.*, 7:303-326.
- Roewer, C. F. 1937. Chelonethi oder Pseudoscorpione. *In* Bronn, H. G., *Klassen und Ordnungen des Tierreichs*, 5(4)(6)(2):161-320.
- West Indies and Caribbean Year Book. 1971. Thomas Skinner Directories; Croyden, England. V. 42, xvii + 1013 pp.
- With, C. J. 1905. On Chelonethi, chiefly from the Australian region, in the collection of the British Museum, with observations on the "Coxal Sac" and on some cases of abnormal segmentation. *Ann. Mag. Nat. Hist. (ser. 7)*, 15:94-143.

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